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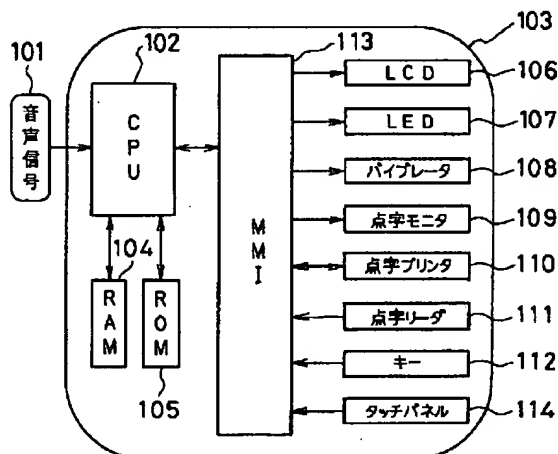
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(54) 【発明の名称】 信号変換装置

(57) 【要約】

【課題】聴覚障害者、視聴覚障害者に電話器、携帯端末等の利用を可能とする信号変換装置の提供。

【解決手段】音声信号をモールス符号に変換しLEDもしくはバイブレータに出力する手段、キーから入力されたモールス符号を音声信号に変換して送信する手段、音声信号を文字信号に変換しLCDに出力する手段、キーボード、タッチパネルより入力された文字を音声信号に変換する手段、音声信号を点字信号に変換し点字表示部に出力する手段、点字入力部から入力された点字信号を音声信号に変換して送信する手段と、を備える。音声信号と、モールス符号、文字信号コード、点字信号コードとの間の信号変換は、ROM内の信号変換表を参照して行う。



【特許請求の範囲】

【請求項1】音声信号をモールス符号に変換し該モールス符号信号を表示手段もしくは振動手段を介して出力する手段と、
入力手段から入力されたモールス符号信号を音声信号に変換して送信する手段と、
を備えたことを特徴とする信号変換装置。

【請求項2】デジタル音声信号とモールス符号との対応を表形式で格納した信号変換表を備え、前記信号変換表を参照して、音声信号とモールス符号との変換を行うことを特徴とする請求項3記載の信号変換装置。

【請求項3】音声信号を文字信号に変換し該文字信号を表示手段に出力する手段と、
キーボードからの入力信号、もしくはタッチパネルより手書き入力された文字を文字符号に変換した信号を音声信号に変換する手段と、
を備えたことを特徴とする信号変換装置。

【請求項4】デジタル音声信号と文字コードとの対応を表形式で格納した信号変換表を備え、前記信号変換表を参照して、音声信号と文字信号の変換を行うことを特徴とする請求項1記載の信号変換装置。

【請求項5】音声信号を点字信号に変換し点字出力する手段と、
点字入力手段より入力された点字信号を音声信号に変換して送信する手段と、
を備えたことを特徴とする信号変換装置。

【請求項6】デジタル音声信号と点字コードとの対応を表形式で格納した信号変換表を備え、前記信号変換表を参照して、音声信号と点字信号の変換を行うことを特徴とする請求項4記載の信号変換装置。

【請求項7】音声信号をモールス符号に変換し該モールス符号信号を表示手段もしくは振動手段を介して出力する手段と、
入力手段から入力されたモールス符号信号を音声信号に変換して送信する手段と、
音声信号を文字信号に変換し表示手段に出力する手段と、

キーボードからの入力信号、もしくはタッチパネルより手書き入力された文字を文字符号に変換した信号を音声信号に変換する手段と、
音声信号を点字信号に変換し点字出力する手段と、
点字入力手段より入力された点字信号を音声信号に変換して送信する手段と、

デジタル音声信号とモールス符号との対応を表形式で格納した第1の信号変換表と、

デジタル音声信号と文字コードの対応を表形式で格納した第2の信号変換表と、

デジタル音声信号と点字コードとの対応を表形式で格納した第3の信号変換表を備え、

音声信号と、モールス符号、文字信号、点字信号との間

の信号変換を前記各信号変換表を参照して行う、ことを特徴とする信号変換装置。

【請求項8】縦3点横2点のボタンを備え、押下されたボタンを凹点として点字入力を行う点字入力手段と、縦3点横2点の該当する点に凹点を形成することで点字表示を行う点字表示手段と、
を備え、

前記点字入力手段から入力されて点字符号を信号変換して音声信号に変換して送信すると共に、受信した音声信号を点字符号に変換し前記点字表示手段に出力する手段を備えたことを特徴とする信号変換装置。

【請求項9】前記点字表示手段が、表示部表面上に各点に対応して開口を有する孔の中に棒状の柱を往復自在に配設し、通常時の平面形成時、該柱の端面が前記表示部表面と同一面とされ、点字表示の除の凹点形成時、該当する点の柱の前記端面が前記表示部平面から窪みを形成する方向に移動する、ことを特徴とする請求項8記載の信号変換装置。

【請求項10】前記点字表示部において表示される点字の送り制御と、戻し制御を行う手段を備えたことを特徴とする請求項8又は9記載の信号変換装置。

【請求項11】前記受信した音声信号を変換した点字信号を点字印刷する手段と、点字読み取り手段をさらに備えた請求項8又は9記載の信号変換装置。

【請求項12】請求項1乃至11のいずれか一に記載の信号変換装置を備えた電話機。

【請求項13】請求項1乃至11のいずれか一に記載の信号変換装置を備えた携帯端末装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、信号変換装置に関し、特に視覚聴覚障害者等の電話器及び携帯端末の利用に好適な信号変換装置に関する。

【0002】

【従来の技術】従来の電話器、携帯端末等は、健常者が使用することを前提に設計されており、音声のみによってユーザに通話内容を伝達していた。

【0003】

【発明が解決しようとする課題】このため聴覚障害者はもちろん視覚聴覚障害者は電話器、携帯端末等がもたらす利便性を受けられずにいた。

【0004】つまり、聴覚障害者は、ファクシミリ等を用いて一方通行の疑似的なリアルタイム通信を行っていた。

【0005】さらに視覚聴覚障害者に至っては遠隔地からの通信を行えない状態であった。

【0006】なお、視覚聴覚障害者用電話機として、例えば特開平3-21472号公報には、視覚障害者には音声と点字、聴覚障害者にはすみ字で受信内容を出力する電話器が提案されている。また特開平5-176025

号公報には、視力、聴力、話力を全く用いることなく相手電話機を改造することなく会話できるようにした電話システムとして、相手先電話番号を送出するための電話機と、相手先電話機からの着信信号を無線により送信する着信信号無線送信装置を備え、着信信号無線送信装置から伝送された着信信号をポケット端末装置で受信し振動により視聴覚障害者に知らせ、点字入力キーボードから入力された点字は音声信号に変換され相手電話機に送信され、相手先電話機から送信された音声信号はデジタル信号に変換され点字プリンタから点字として出力されるようにしたシステムが提案されている。さらに特開平8-44473号公報には、視覚障害者用の入力装置及び出力装置として、モールス符号によって情報を入力する入力装置、電子装置から出力される情報をモールス符号音に変換して出力する出力装置の構成が提案されている。

【0007】したがって本発明は、上記問題点を鑑みてなされたものであって、その目的は、聴覚障害者、視聴覚障害者に電話器、携帯端末等の利用を可能とする信号変換装置を提供することにある。

【0008】

【課題を解決するための手段】前記目的を達成するため、本願第1発明は、音声信号をモールス符号に変換し該モールス符号を表示手段もしくは振動手段にて出力する手段と、入力されたモールス符号を音声信号に変換して送信する手段と、を備える。また、本願第2発明は、音声信号を文字信号に変換し表示手段に出力する手段と、キーボードからの入力信号、もしくはタッチパネルより手書き入力された文字を文字信号に変換した信号を音声信号に変換する手段と、を備えるさらに本願第3発明は、音声信号を点字信号に変換し点字出力する手段と、入力された点字信号を音声信号に変換して送信する手段と、を備える。本願第4発明は上記第1乃至第3発明の構成を全て含んで構成される。

【0009】

【発明の実施の形態】本発明の実施の形態について以下に説明する。図1は、本発明の一実施の形態の構成を示す図である。図1を参照すると、本発明の一実施の形態において、信号変換装置(103)は、通話相手からの音声信号(101)を受信する制御手段(102)と、制御手段(102)が受信した音声信号101を一時的に蓄える第1の記憶手段(104)と、装置内に予めデータを蓄えておくための第2の記憶手段(105)と、第1の記憶手段(104)と第2の記憶手段(105)の内容を比較して変換する変換手段と、変換された信号をユーザに通知するMMI(マンマシンインタフェース)機能手段(106~114)から構成される。また、MMI機能手段(106~114)はユーザが通話内容を入力することもできる。

【0010】本発明の一実施の形態において、信号変換

器(103)は、音声信号(101)を、聴覚障害者及び視聴覚障害者が認識できる信号に変換する。聴覚障害者及び視聴覚障害者が認識できる信号としては、文字、点字、モールス信号等である。

【0011】例えば、文字信号に変換した場合には、LCD(液晶表示装置)(106)に、受話内容を文字表示する。また、送話の際は、キー(112)により入力された文字を音声信号(101)に変換し、通話相手へ送信する。

【0012】例えば、点字信号に変換された場合には、点字モニタ(109)もしくは点字プリンタ(110)により、受話内容をユーザに通知する。また、送話の際は点字モニタ(109)を用いてもしくは点字リーダー(111)を用いて点字信号を入力し、さらに音声信号に変換して通話相手へ送信する。

【0013】例えば、モールス信号の場合には、LED(発光ダイオード)(107)、パイプレータ(108)を用いて受話内容をユーザに通知する。また、送話の際は、キー(112)を用いてモールス信号を入力し、さらに音声信号に変換して通話相手へ送信する。

【0014】このように、聴覚障害者及び視聴覚障害者も健常者と同じく家庭内電話、携帯端末等を用いて通話することができる。

【0015】

【実施例】上記した本発明の実施の形態についてさらに詳細に説明すべく、本発明の実施例について図面を参照して以下に説明する。図1は、本発明の第一の実施例の構成を示す図である。

【0016】図1を参照すると、本発明の第一の実施例において、信号変換装置103は、通話相手からの音声信号101を受信するCPU(中央処理装置)102と、CPU102が受信した音声信号101を一時的に蓄えるRAM(ランダムアクセスメモリ)104と、あらかじめ装置内にデータを蓄えておくためのROM(リードオンリメモリ)105と、RAM104とROM105の内容を比較し変換する変換手段(CPU102)と、変換された信号をユーザに通知するMMI(マンマシンインタフェース)機能手段106~114から構成される。また、MMI機能手段106~114はユーザが通話内容を入力することもできる。

【0017】図1を参照して本発明の第一の実施例の動作概要を説明する。信号変換装置100は、通話相手からの音声信号101をCPU102で受信する。CPU102は受信した音声信号101をRAM104に蓄える。さらにCPU102は、RAM104内の音声信号101とROM105内の視聴覚障害者が認識できる信号を比較し変換する。

【0018】変換された信号はMMI部113に送信され、LCD106、LED107等を制御して交換局からの音声信号101をユーザに通知する。

【0019】また、信号変換装置100は、ユーザが通話内容を入力できるキー112等を持つ。キー112等から入力された信号はMMI部113を介してCPU102に送信され、RAM104内に蓄えられる。

【0020】さらにCPU102は、RAM104内の信号とROM105内の音声信号101を比較し変換する。変換された音声信号101は通話相手へ送信される。

【0021】次に本発明の第一の実施例の動作について説明する。

【0022】受話の場合、通話内容は交換局を通して音声信号101として電話器本体に送信される。信号変換装置は、不図示のA/D変換器を備え、アナログ音声信号101をデジタル音声信号に変換する。デジタル音声信号はCPU102に入力され一旦RAM104内に蓄積される。

【0023】ここで、ROM105内にはデジタル音声信号—モールス信号ないしはユーザが認識できる信号変換表が蓄積されている。

【0024】CPU102は、ROM105内の信号変換表と、RAM104内のデジタル音声信号とを比較し、通話相手からの音声信号101をモールス信号ないしはユーザが認識できる信号に変換する。

【0025】さらに、CPU102は、モールス信号ないしはユーザが認識できる信号に基づいて、MMI部113を制御し、LED107を点滅させて、通話先からの通話内容をユーザに伝達する。

【0026】また送話の場合、ユーザがキー112押下し、モールス信号ないしはユーザが認識できる信号を入力することにより、ユーザからの送話内容がMMI部113に入力される。

【0027】MMI部113は、ユーザが入力したモールス信号ないしはユーザが認識できる信号をCPU102に送信する。CPU102は受話時と逆の動作を行い通話内容を交換局へ送信する。

【0028】すなわち、CPU102はユーザが入力したモールス信号ないしはユーザが認識できる信号を一旦RAM104内に蓄積する。ここで、前述のようにROM内にはデジタル音声信号—モールス信号ないしはユーザが認識できる信号変換表が蓄積されているので、CPU102は、ROM105内の信号変換表とRAM104内のを比較し、ユーザが入力したモールス信号ないしはユーザが認識できる信号をデジタル音声信号に変換する。

【0029】さらに、デジタル音声信号は不図示のD/A変換器によりアナログ音声信号101に変換され、交換局に送信される。

【0030】なお、デジタル携帯電話機の場合には、交換局から符号化された音声信号101が送信されるので、ROM105内の変換表を音声コード—モールス信

号ないしはユーザが認識できる信号に換えることにより、A/D変換、D/A変換を行うことなく通話可能となる。

【0031】次に本発明の他の実施例について以下に説明する。

【0032】本発明の第二の実施例について説明する。視聴覚障害者はLED107による点滅表示を認識できないため、本発明の第二の実施例においては、前記第一の実施例におけるLED107を、バイブレータに換えたものである。バイブレータにより、モールス信号ないしはユーザが認識できる信号を振動でユーザに伝える。

【0033】本発明の第三の実施例について説明する。本発明の第三の実施例は、LCD106、キー112、タッチパネル114等を用いて、モールス信号ないしはユーザが認識できる信号の代わりに、文字信号を用いたものである。

【0034】受話の場合、通話内容は、交換局を通して音声信号101として電話器本体に送信される。信号変換装置103は、不図示のA/D変換器を備え、アナログ音声信号101をデジタル音声信号に変換する。デジタル音声信号はCPU102に入力され一旦RAM105内に蓄積される。

【0035】ここで、ROM105内には、デジタル音声信号—文字信号変換表が蓄積されている。CPU102はROM105内の信号変換表とRAM104内のデジタル音声信号を比較し、通話相手からの音声信号101を文字信号に変換する。

【0036】さらにCPU102は、文字信号に基づいてMMI部113を制御し、LCD106に文字表示させて、通話先からの通話内容をユーザに伝達する。

【0037】また送話の場合、ユーザがキー112押下し、文字信号を入力することにより、もしくは、ユーザが送話内容を、タッチパネル114に手書き入力することにより、ユーザからの送話内容がMMI部113に入力される。

【0038】MMI部113はユーザが入力した文字信号をCPU102に送信する。CPU102は受話時と逆の動作を行い、通話内容を交換局へ送信する。つまり、CPU102はユーザが入力した文字信号を一旦RAM105内に蓄積する。

【0039】ここで、前述のようにROM105内にはデジタル音声信号—文字信号変換表が蓄積されているので、CPU102はROM105内の変換表とRAM104内のを比較し、ユーザが入力した文字信号をデジタル音声信号に変換する。

【0040】さらに、前記デジタル音声信号は不図示のD/A変換器によりアナログ音声信号101に変換され、不図示の交換局に送信される。

【0041】なお、デジタル携帯電話の場合は交換局から符号化された音声信号101が送信されるので、R

OM105内の変換表を音声コード-文字信号に換えることにより、A/D変換、D/A変換を行うことなく通話可能となる。

【0042】本発明の第四の実施例は、ユーザとのインターフェースに、点字モニタ109、点字プリンタ110、点字リーダ111を用いて、ユーザインタフェースを点字信号にする。詳細を以下に説明する。

【0043】まず、点字モニタ109、点字リーダ111について図2を用いて説明する。図2は、本発明の第四の実施例における携帯電話機201の外観を示す斜視図である。点字モニタ109は、点字表示部202、戻しボタン203、送りボタン204、終了ボタン205、点字入力部206を備えて構成される。

【0044】点字表示部202は、通常時は平面だが、点字表示する際に、該当する点がそれぞれ凹点を作ることによって点字表示を行う。

【0045】ここで、凹点の作り方を図3を用いて説明する。図3に示すように、点字表示部202の点字部は、内部に円柱302が配設されており、この円柱の昇降により、平面/凹点を作る。

【0046】また、送りボタン204押下により次の点字が表示され、送りボタン204長押しにより早送りされる。同様に戻しボタン203押下により一つ前の点字が表示され、戻しボタン203長押しにより巻戻しされる。

【0047】表示を終了させ、点字表示部202を平面に戻す場合は、終了ボタン205押下する。

【0048】また、点字入力部206は、点字の各点を意味する6つのボタンより構成される。例えば、この6つのボタンは電話器本体のダイヤルボタンを兼ね、図2に示すように配列する。それぞれの点の押下が点字の凹点を意味し、送りボタン204を押下することにより送信される。入力中の点字はキャンセルは戻しボタン203押下により行う。

【0049】なお、入力中の点字は、点字表示部202に表示され、送信点字表示と受信点字表示の表示切替は終了ボタン205押下により行う。なお、点字表示部202を送信用、受信用にわけて2つ用意した場合、表示切替は不要である。

【0050】点字リーダ111は、装置底部に配置され、ユーザが点字上を直接なぞることにより、赤外線センサによる三点測量法、もしくは触感センサにより点字の凹点を見知し点字を認識する。

【0051】次に本発明の第四の実施例の詳細を説明する。受話の場合、通話内容は交換局を通して音声信号101として電話器本体に送信される。

【0052】信号変換装置103は、不図示のA/D変換器を備えアナログ音声信号101をデジタル音声信号に変換する。デジタル音声信号はCPU102に入力され一旦RAM105内に蓄積される。ここで、RO

M内にはデジタル音声信号-点字信号変換表が蓄積されている。

【0053】CPU102は、ROM105内の変換表とRAM104内のデジタル音声信号を比較し、通話相手からの音声信号101を点字信号に変換する。さらにCPU102は前記点字信号に基づいてMMI部113を介して点字プリンタを制御する。

【0054】点字プリンタ110はプレスにより凹点を作り、点字表記したロール状紙面をプリントアウトすることにより、通話先からの通話内容をユーザに伝達する。もしくは図2に示す点字モニタ109を用いて通話内容をユーザに伝達する。

【0055】また送話の場合、ユーザが点字リーダ111、もしくは点字モニタ109を用いて点字信号を入力することにより、ユーザからの送話内容がMMI部113に入力される。

【0056】MMI部113はユーザが入力した点字信号をCPU102に送信する。CPU102は受話時と逆の動作を行い通話内容を交換局へ送信する。つまり、CPU102はユーザが入力した点字信号を一旦RAM105内に蓄積する。

【0057】ここで、前述のように、ROM内にはデジタル音声信号-点字信号変換表が蓄積されているので、CPU102はROM105内の変換表とRAM104内のを比較し、ユーザが入力した点字信号をデジタル音声信号に変換する。さらに、前記デジタル音声信号は、D/A変換器によりアナログ音声信号101に変換され、交換局に送信される。

【0058】なお、デジタル携帯電話の場合には、交換局から符号化された音声信号101が送信されるので、ROM105内の変換表を音声コード-点字信号に換えることにより、A/D変換、D/A変換を行うことなく通話可能となる。

【0059】

【発明の効果】以上説明したように、本発明によれば、音声信号を聴覚障害者及び視聴覚障害者が認識できる信号に変換する手段を備えたことにより、聴覚障害者及び視聴覚障害者も健常者と同じく家庭内電話、携帯端末等を用いて通話することができる、という効果を奏する。

【図面の簡単な説明】

【図1】本発明の一実施例の構成を示す図である。

【図2】本発明の他の実施例における点字モニタ、点字リーダの構成を説明するための図である。

【図3】本発明の他の実施例における点字表示部を説明するための図である。

【符号の説明】

101 音声信号

102 CPU

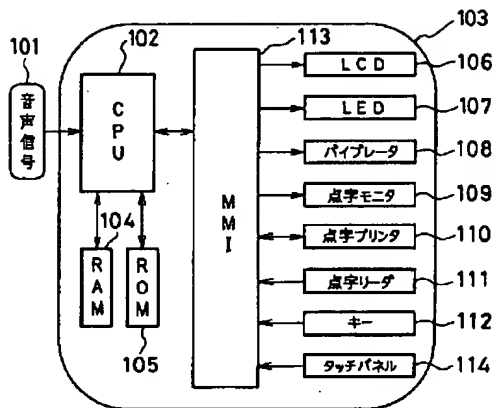
103 信号変換装置

104 RAM

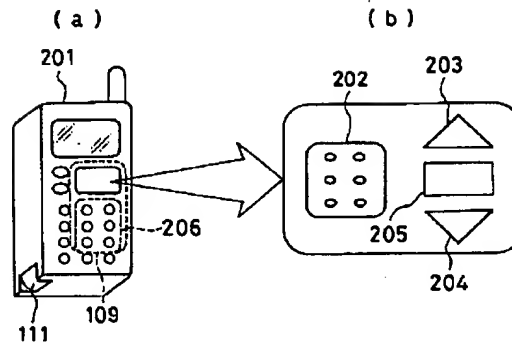
105 ROM
106 LCD
107 LED
108 バイブレタ
109 点字モニタ
110 点字プリンタ
111 点字リダ
112 キー

113 MMI
114 タッチパネル
202 点字表示部
203 戻しボタン
204 送りボタン
205 終了ボタン
206 点字入力部
302 円柱

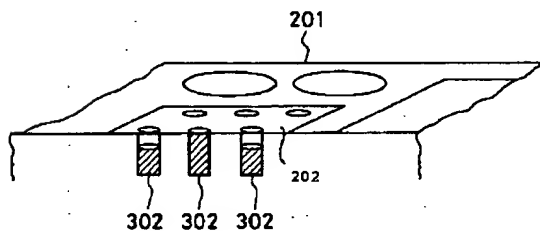
【図1】



【図2】



【図3】



【手続補正書】

【提出日】平成11年6月7日

【手続補正1】

【補正対象書類名】明細書

【補正対象項目名】特許請求の範囲

【補正方法】変更

【補正内容】

【特許請求の範囲】

【請求項1】受信した符号化音声信号をモールス符号に変換し該モールス符号信号を表示手段もしくは振動手段を介して出力する手段と、
入力手段から入力されたモールス符号信号を音声信号に変換して送信する手段を備えたことを特徴とする携帯端末装置。

【請求項2】デジタル音声信号と文字コードとの対応を

表形式で格納した信号変換表を備え、前記信号変換表を参照して、音声信号と文字信号の変換を行うことを特徴とする請求項1記載の携帯端末装置。

【請求項3】受信した符号化音声信号を点字信号に変換し点字表示する手段と、
点字入力手段より入力された点字信号を音声信号に変換して送信する手段と、を備えたことを特徴とする携帯端末装置。

【請求項4】デジタル音声信号と点字コードとの対応を表形式で格納した信号変換表を備え、前記信号変換表を参照して、音声信号と点字信号の変換を行うことを特徴とする請求項3記載の携帯端末装置。

【請求項5】前記点字入力手段が、縦3点横2点のボタンを備え、押下されたボタンを凹点として点字入力を行

い、

縦3点横2点の該当する点に凹点を形成することで点字表示を行う点字表示手段を備え、

前記点字入力手段から入力されて点字符号を信号変換して音声信号に変換して送信すると共に、受信した音声信号を点字符号に変換し前記点字表示手段に出力する、ことを特徴とする請求項3記載の携帯端末装置。

【請求項6】前記点字表示手段が、表示部表面上に各点に対応して開口を有する孔の中に棒状の柱を往復自在に配設し、通常時の平面形成時、該柱の端面が前記表示部表面と同一面とされ、点字表示の凹点形成時、該当する点の柱の前記端面が前記表示部平面から窪みを形成する方向に移動する、ことを特徴とする請求項3記載の携帯端末装置。

【手続補正2】

【補正対象書類名】明細書

【補正対象項目名】0008

【補正方法】変更

【補正内容】

【0008】

【課題を解決するための手段】前記目的を達成するため、本発明は、受信した符号化音声信号をモールス符号に変換し該モールス符号信号を表示手段もしくは振動手段を介して出力する手段と、入力手段から入力されたモールス符号信号を音声信号に変換して送信する手段とを備える。デジタル音声信号と文字コードとの対応を表形式で格納した信号変換表を備え、前記信号変換表を参照して、音声信号と文字信号の変換を行う。また本発明は、受信した符号化音声信号を点字信号に変換し点字表示する手段と、点字入力手段より入力された点字信号を音声信号に変換して送信する手段とを備える。

フロントページの続き

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TECHNICAL FIELD

[Field of the Invention] This invention relates to telephones, such as a vision hearing-impaired person, and the suitable signal converter for use of a personal digital assistant especially about a signal converter.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] The conventional telephone, a personal digital assistant, etc. are designed on the assumption that a healthy person uses it, and they were transmitting the contents of a message to the user only with voice.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] For this reason, of course, the sight-and-hearing-handicaps person had the hearing-impaired person, without the ability receiving the convenience which telephone, a personal digital assistant, etc. bring about.

[0004] That is, the hearing-impaired person was performing the one-way false real-time communication link using facsimile etc.

[0005] If it furthermore resulted in the sight-and-hearing-handicaps person, it was in the condition that the communication link from a remote place cannot be performed.

[0006] In addition, the telephone which lives in voice, Braille points, and a hearing-impaired person at a visually impaired person, and outputs receiving contents to JP,3-21472,A with a character as telephone for sight-and-hearing-handicaps persons is proposed. moreover, as a telephone system which enabled it to talk, without converting partner telephone into JP,5-176025,A, without completely using eyesight, hearing, and **** It has the terminating signal wireless sending set which transmits the terminating signal from the telephone and phase hand telephone for sending out the phase hand telephone number by wireless. A pocket terminal unit receives and a sight-and-hearing-handicaps person is told about the terminating signal transmitted from the terminating signal wireless sending set by vibration. The sound signal which the Braille points inputted from the Braille-points input keyboard were changed into the sound signal, were transmitted to partner telephone, and was transmitted from phase hand telephone is changed into a digital signal, and the system which was made to be outputted as Braille points from the Braille-points printer is proposed. Furthermore, the configuration of the output unit which changes and outputs the information outputted from the input unit which inputs information, and an electronic instrument to a Morse code sound with the Morse code as the input unit and output unit for visually impaired persons is proposed by JP,8-44473,A.

[0007] Therefore, this invention is made in view of the above-mentioned trouble, and the purpose is in providing a hearing-impaired person and a sight-and-hearing-handicaps person with the signal converter which enables use of telephone, a personal digital assistant, etc.

[Translation done.]

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MEANS

[Means for Solving the Problem] In order to attain said purpose, the 1st invention of this application is equipped with a means to change a sound signal into the Morse code and to output this Morse code with a display means or an oscillating means, and a means to change the inputted Morse code into a sound signal, and to transmit. Moreover, the 3rd invention of this application equips a pan equipped with a means change into a sound signal a means the 2nd invention of this application changes a sound signal into an alphabetic signal, and output to a display means, and the input signal from a keyboard or the signal which changed into the character code the alphabetic character by which the handwriting input was carried out from the touch panel with the means which changes a sound signal into a Braille-points signal, and carries out a Braille-points output, and a means change the inputted Braille-points signal into a sound signal, and transmit. The 4th invention of this application is constituted including all the configurations of the above 1st thru/or the 3rd invention.

[0009]

[Embodiment of the Invention] The gestalt of operation of this invention is explained below. Drawing 1 is drawing showing the configuration of the gestalt of 1 operation of this invention. If drawing 1 is referred to, it will set in the gestalt of 1 operation of this invention. A signal converter (103) The control means which receives the sound signal (101) from a message partner (102), The 1st storage means which stores temporarily the sound signal 101 which the control means (102) received (104), The 2nd storage means for storing data beforehand in equipment (105), It consists of a conversion means to compare and change the contents of the 1st storage means (104) and the 2nd storage means (105), and an MMI (man machine interface) functional means (106-114) to notify a user of the changed signal. Moreover, as for an MMI functional means (106-114), a user can also input the contents of a message.

[0010] A signal converter (103) is changed into the signal with which a hearing-impaired person and a sight-and-hearing-handicaps person can recognize a sound signal (101) in the gestalt of 1 operation of this invention. As a signal which a hearing-impaired person and a sight-and-hearing-handicaps person can recognize, they are an alphabetic character, Braille points, the Morse code, etc.

[0011] For example, when it changes into an alphabetic signal, character representation of the contents of a receiver is carried out to LCD (liquid crystal display) (106). Moreover, the alphabetic character inputted by the key (112) is changed into a sound signal (101) in the case of transmission, and it transmits it to a message partner.

[0012] For example, when changed into a Braille-points signal, a Braille-points monitor (109) or a Braille-points printer (110) informs a user of the contents of a receiver. Moreover, a Braille-points signal is inputted using a Braille-points reader (111) in the case of transmission, using a Braille-points monitor (109), it changes it into a sound signal further, and is transmitted to a message partner.

[0013] For example, in the case of the Morse code, a user is notified of the contents of a receiver using LED (light emitting diode) (107) and vibrator (108). Moreover, the Morse code is inputted using a key (112) in the case of transmission, it changes it into a sound signal further, and is transmitted to a message partner.

[0014] Thus, a hearing-impaired person and a sight-and-hearing-handicaps person as well as a healthy person can talk over the telephone using a domestic telephone, a personal digital assistant, etc.

[Translation done.]

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EXAMPLE

[Example] The gestalt of operation of above-mentioned this invention is explained below with reference to a drawing about the example of this invention that it should explain to a detail further. Drawing 1 is drawing showing the configuration of the first example of this invention.

[0016] If drawing 1 is referred to, it will set in the first example of this invention. A signal converter 103 CPU102 which receives the sound signal 101 from a message partner (central processing unit), RAM104 which stores temporarily the sound signal 101 which CPU102 received (random access memory), ROM105 for storing data in equipment beforehand (read-only memory), It consists of a conversion means (CPU102) to compare and change the contents of RAM104 and ROM105, and MMI (man machine interface) functional means 106-114 to notify a user of the changed signal. Moreover, as for the MMI functional means 106-114, a user can also input the contents of a message.

[0017] With reference to drawing 1, the outline of the first example of this invention of operation is explained. A signal converter 100 receives the sound signal 101 from a message partner by CPU102. CPU102 stores the received sound signal 101 in RAM104. Furthermore, CPU102 compares and changes the signal which the sight-and-hearing-handicaps person in the sound signal 101 in RAM104 and ROM105 can recognize.

[0018] It is transmitted to the MMI section 113, and the changed signal controls LCD106 and LED107 grade, and notifies a user of the sound signal 101 from the exchange.

[0019] Moreover, a signal converter 100 has the key 112 grade into which a user can input the contents of a message. It is transmitted to CPU102 through the MMI section 113, and the signal inputted from the key 112 grade is stored in RAM104.

[0020] Furthermore, CPU102 compares and changes the signal in RAM104, and the sound signal 101 in ROM105. The changed sound signal 101 is transmitted to a message partner.

[0021] Next, actuation of the first example of this invention is explained.

[0022] In the case of a receiver, the contents of a message are transmitted to the body of telephone as a sound signal 101 through the exchange. A signal converter is equipped with a non-illustrated A/D converter, and changes the analog sound signal 101 into a digital sound signal. A digital sound signal is inputted into CPU102, and is once accumulated into RAM104.

[0023] Here, into ROM105, the signal transformation table which the digital sound signal-Morse code or a user can recognize is accumulated.

[0024] CPU102 compares the signal transformation table in ROM105 with the digital sound signal in RAM104, and changes it into the signal with which the Morse code or a user can recognize the sound signal 101 from a message partner.

[0025] Furthermore, based on the signal which the Morse code or a user can recognize, CPU102 controls the MMI section 113, blinks LED107, and transmits the contents of a message from a message place to a user.

[0026] Moreover, in transmission, the contents of transmission from a user are inputted into the MMI section 113 by a user's pushing key 112 and inputting the signal which the Morse code or a user can recognize.

[0027] The MMI section 113 transmits the signal which the Morse code or the user whom the user inputted can recognize to CPU102. CPU102 performs actuation contrary to the time of a receiver, and transmits the contents of a message to the exchange.

[0028] That is, CPU102 once accumulates the signal which the Morse code or the user whom the user inputted can recognize into RAM104. Here, since the signal transformation table which the digital sound signal-Morse code or a user can recognize is accumulated into ROM as mentioned above, CPU102 compares the signal transformation table in ROM105 with that in RAM104, and changes into a digital sound signal the signal which the Morse code or the user whom the user inputted can recognize.

[0029] Furthermore, a digital sound signal is changed into the analog sound signal 101 by the non-illustrated D/A converter, and is transmitted to the exchange.

[0030] In addition, since the sound signal 101 encoded from the exchange is transmitted in the case of a digital portable telephone, a message becomes possible by changing the conversion table in ROM105 to the signal which the voice message identification code-Morse code or a user can recognize, without performing A/D conversion and D/A conversion.

[0031] Next, other examples of this invention are explained below.

[0032] The second example of this invention is explained. Since a sight-and-hearing-handicaps person cannot recognize the flashing display by LED107, he changes LED107 in said first example to vibrator in the second example of this invention. By vibrator, the signal which the Morse code or a user can recognize is told to a user by vibration.

[0033] The third example of this invention is explained. An alphabetic signal is used for the third example of this invention

instead of being the signal which the Morse code or a user can recognize using LCD106, a key 112, and touch panel 114 grade.

[0034] In the case of a receiver, the contents of a message are transmitted to the body of telephone as a sound signal 101 through the exchange. A signal converter 103 is equipped with a non-illustrated A/D converter, and changes the analog sound signal 101 into a digital sound signal. A digital sound signal is inputted into CPU102, and is once accumulated into RAM105.

[0035] Here, into ROM105, the digital sound signal-alphabetic character signal transformation table is accumulated. CPU102 compares the digital sound signal in the signal transformation table in ROM105, and RAM104, and changes the sound signal 101 from a message partner into an alphabetic signal.

[0036] Furthermore, CPU102 controls the MMI section 113 based on an alphabetic signal, it is made it to carry out character representation to LCD106, and it transmits the contents of a message from a message place to a user.

[0037] Moreover, in transmission, a user pushes key 112, and when [which input an alphabetic signal] it depends especially or a user does the handwriting input of the contents of transmission at a touch panel 114, the contents of transmission from a user are inputted into the MMI section 113.

[0038] The MMI section 113 transmits the alphabetic signal which the user inputted to CPU102. CPU102 performs actuation contrary to the time of a receiver, and transmits the contents of a message to the exchange. That is, CPU102 once accumulates the alphabetic signal which the user inputted into RAM105.

[0039] Here, since the digital sound signal-alphabetic character signal transformation table is accumulated into ROM105 as mentioned above, CPU102 compares the conversion table in ROM105 with that in RAM104, and changes into a digital sound signal the alphabetic signal which the user inputted.

[0040] Furthermore, said digital sound signal is changed into the analog sound signal 101 by the non-illustrated D/A converter, and is transmitted to the non-illustrated exchange.

[0041] In addition, since the sound signal 101 encoded from the exchange is transmitted, the message of the case of a digital cellular phone is attained by changing the conversion table in ROM105 to a voice message identification code-alphabetic signal, without performing A/D conversion and D/A conversion.

[0042] The fourth example of this invention uses the Braille-points monitor 109, the Braille-points printer 110, and the Braille-points reader 111 for an interface with a user, and makes a user interface a Braille-points signal. A detail is explained below.

[0043] First, the Braille-points monitor 109 and the Braille-points reader 111 are explained using drawing 2. Drawing 2 is the perspective view showing the appearance of the portable telephone 201 in the fourth example of this invention. The Braille-points monitor 109 is equipped with the Braille-points display 202, the return carbon button 203, a stepper button 204, the termination carbon button 205, and the Braille-points input section 206, and is constituted.

[0044] Although it is a flat surface at the time, in case the Braille-points display 202 indicates by Braille points, when the corresponding point makes ****, respectively, it usually performs a Braille-points display.

[0045] Here, how to make **** is explained using drawing 3. As shown in drawing 3, the cylinder 302 is arranged in the interior and the Braille-points section of the Braille-points display 202 makes a flat surface/**** by rise and fall of this cylinder.

[0046] Moreover, the following Braille points are displayed by stepper-button 204 depression, and it is fast forwarded by stepper-button 204 length push. It returns similarly, the Braille points in front of one are displayed by carbon button 203 depression, and return carbon button 203 length push rewinds.

[0047] When terminating a display and returning the Braille-points display 202 to a flat surface, termination carbon button 205 depression is carried out.

[0048] Moreover, the Braille-points input section 206 consists of six carbon buttons which mean each point of Braille points. For example, these six carbon buttons serve as the dial carbon button of the body of telephone, and as shown in drawing 2, they arrange it. The depression of each point means **** of Braille points, and it is transmitted by carrying out the depression of the stepper button 204. The Braille points under input perform cancellation by return carbon button 203 depression.

[0049] In addition, the Braille points under input are displayed on the Braille-points display 202, and termination carbon button 205 depression performs the display change of a transmitting Braille-points display and a receiving Braille-points display. In addition, the display change is unnecessary, when the Braille-points display 202 is divided into the object for transmission, and reception and is prepared two.

[0050] When it is arranged at an equipment pars basilaris ossis occipitalis and a user traces a Braille-points top directly, the Braille-points reader 111 **** of Braille points by the tripartite measure by the infrared sensor, or the tactile feeling sensor, and recognizes Braille points.

[0051] Next, the detail of the fourth example of this invention is explained. In the case of a receiver, the contents of a message are transmitted to the body of telephone as a sound signal 101 through the exchange.

[0052] A signal converter 103 is equipped with a non-illustrated A/D converter, and changes the analog sound signal 101 into a digital sound signal. A digital sound signal is inputted into CPU102, and is once accumulated into RAM105. Here, into ROM, the digital sound signal-Braille-points signal transformation table is accumulated.

[0053] CPU102 compares the digital sound signal in the conversion table in ROM105, and RAM104, and changes the sound signal 101 from a message partner into a Braille-points signal. Furthermore, CPU102 controls a Braille-points printer through the MMI section 113 based on said Braille-points signal.

[0054] The Braille-points printer 110 transmits the contents of a message from a message place to a user by making **** with a press and printing out the roll-like space which carried out the Braille-points notation. Or the contents of a message are transmitted to a user using the Braille-points monitor 109 shown in drawing 2.

[0055] Moreover, in transmission, when a user inputs a Braille-points signal using the Braille-points reader 111 or the Braille-points monitor 109, the contents of transmission from a user are inputted into the MMI section 113.

[0056] The MMI section 113 transmits the Braille-points signal which the user inputted to CPU102. CPU102 performs actuation contrary to the time of a receiver, and transmits the contents of a message to the exchange. That is, CPU102 once accumulates the Braille-points signal which the user inputted into RAM105.

[0057] Here, as mentioned above, since the digital sound signal-Braille-points signal transformation table is accumulated into ROM, CPU102 compares the conversion table in ROM105 with that in RAM104, and changes into a digital sound signal the Braille-points signal which the user inputted. Furthermore, said digital sound signal is changed into the analog sound signal 101 by the D/A converter, and is transmitted to the exchange.

[0058] In addition, since the sound signal 101 encoded from the exchange is transmitted in the case of a digital cellular phone, a message becomes possible by changing the conversion table in ROM105 to a voice message identification code-Braille-points signal, without performing A/D conversion and D/A conversion.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is drawing showing the configuration of one example of this invention.

[Drawing 2] It is drawing for explaining the configuration of the Braille-points monitor in other examples of this invention, and a Braille-points reader.

[Drawing 3] It is drawing for explaining the Braille-points display in other examples of this invention.

[Description of Notations]

101 Sound Signal
102 CPU
103 Signal Converter
104 RAM
105 ROM
106 LCD
107 LED
108 BAIBURE 0 TA
109 Braille-Points Monitor
110 Braille-Points Printer
111 Braille-Points Li 0 DA
112 KI 0
113 MMI
114 Touch Panel
202 Braille-Points Display
203 Return Carbon Button
204 Stepper Button
205 Termination Carbon Button
206 Braille-Points Input Section
302 Cylinder

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to telephones, such as a vision hearing-impaired person, and the suitable signal converter for use of a personal digital assistant especially about a signal converter.

[0002]

[Description of the Prior Art] The conventional telephone, a personal digital assistant, etc. are designed on the assumption that a healthy person uses it, and they were transmitting the contents of a message to the user only with voice.

[0003]

[Problem(s) to be Solved by the Invention] For this reason, of course, the sight-and-hearing-handicaps person had the hearing-impaired person, without the ability receiving the convenience which telephone, a personal digital assistant, etc. bring about.

[0004] That is, the hearing-impaired person was performing the one-way false real-time communication link using facsimile etc.

[0005] If it furthermore resulted in the sight-and-hearing-handicaps person, it was in the condition that the communication link from a remote place cannot be performed.

[0006] In addition, the telephone which lives in voice, Braille points, and a hearing-impaired person at a visually impaired person, and outputs receiving contents to JP,3-21472,A with a character as telephone for sight-and-hearing-handicaps persons is proposed. moreover, as a telephone system which enabled it to talk, without converting partner telephone into JP,5-176025,A, without completely using eyesight, hearing, and **** It has the terminating signal wireless sending set which transmits the terminating signal from the telephone and phase hand telephone for sending out the phase hand telephone number by wireless. A pocket terminal unit receives and a sight-and-hearing-handicaps person is told about the terminating signal transmitted from the terminating signal wireless sending set by vibration. The sound signal which the Braille points inputted from the Braille-points input keyboard were changed into the sound signal, were transmitted to partner telephone, and was transmitted from phase hand telephone is changed into a digital signal, and the system which was made to be outputted as Braille points from the Braille-points printer is proposed. Furthermore, the configuration of the output unit which changes and outputs the information outputted from the input unit which inputs information, and an electronic instrument to a Morse code sound with the Morse code as the input unit and output unit for visually impaired persons is proposed by JP,8-44473,A.

[0007] Therefore, this invention is made in view of the above-mentioned trouble, and the purpose is in providing a hearing-impaired person and a sight-and-hearing-handicaps person with the signal converter which enables use of telephone, a personal digital assistant, etc.

[0008]

[Means for Solving the Problem] In order to attain said purpose, the 1st invention of this application is equipped with a means to change a sound signal into the Morse code and to output this Morse code with a display means or an oscillating means, and a means to change the inputted Morse code into a sound signal, and to transmit. Moreover, the 3rd invention of this application equips a pan equipped with a means change into a sound signal a means the 2nd invention of this application changes a sound signal into an alphabetic signal, and output to a display means, and the input signal from a keyboard or the signal which changed into the character code the alphabetic character by which the handwriting input was carried out from the touch panel with the means which changes a sound signal into a Braille-points signal, and carries out a Braille-points output, and a means change the inputted Braille-points signal into a sound signal, and transmit. The 4th invention of this application is constituted including all the configurations of the above 1st thru/or the 3rd invention.

[0009]

[Embodiment of the Invention] The gestalt of operation of this invention is explained below. Drawing 1 is drawing showing the configuration of the gestalt of 1 operation of this invention. If drawing 1 is referred to, it will set in the gestalt of 1 operation of this invention. A signal converter (103) The control means which receives the sound signal (101) from a message partner (102), The 1st storage means which stores temporarily the sound signal 101 which the control means (102) received (104), The 2nd storage means for storing data beforehand in equipment (105), It consists of a conversion means to compare and change the contents of the 1st storage means (104) and the 2nd storage means (105), and an MMI (man machine interface) functional means (106-114) to notify a user of the changed signal. Moreover, as for an MMI functional means (106-114), a user can also input the contents of a message.

[0010] A signal converter (103) is changed into the signal with which a hearing-impaired person and a

sight-and-hearing-handicaps person can recognize a sound signal (101) in the gestalt of 1 operation of this invention. As a signal which a hearing-impaired person and a sight-and-hearing-handicaps person can recognize, they are an alphabetic character, Braille points, the Morse code, etc.

[0011] For example, when it changes into an alphabetic signal, character representation of the contents of a receiver is carried out to LCD (liquid crystal display) (106). Moreover, the alphabetic character inputted by the key (112) is changed into a sound signal (101) in the case of transmission, and it transmits it to a message partner.

[0012] For example, when changed into a Braille-points signal, a Braille-points monitor (109) or a Braille-points printer (110) informs a user of the contents of a receiver. Moreover, a Braille-points signal is inputted using a Braille-points reader (111) in the case of transmission, using a Braille-points monitor (109), it changes it into a sound signal further, and is transmitted to a message partner.

[0013] For example, in the case of the Morse code, a user is notified of the contents of a receiver using LED (light emitting diode) (107) and vibrator (108). Moreover, the Morse code is inputted using a key (112) in the case of transmission, it changes it into a sound signal further, and is transmitted to a message partner.

[0014] Thus, a hearing-impaired person and a sight-and-hearing-handicaps person as well as a healthy person can talk over the telephone using a domestic telephone, a personal digital assistant, etc.

[0015]

[Example] The gestalt of operation of above-mentioned this invention is explained below with reference to a drawing about the example of this invention that it should explain to a detail further. Drawing 1 is drawing showing the configuration of the first example of this invention.

[0016] If drawing 1 is referred to, it will set in the first example of this invention. A signal converter 103 CPU102 which receives the sound signal 101 from a message partner (central processing unit), RAM104 which stores temporarily the sound signal 101 which CPU102 received (random access memory), ROM105 for storing data in equipment beforehand (read-only memory), It consists of a conversion means (CPU102) to compare and change the contents of RAM104 and ROM105, and MMI (man machine interface) functional means 106-114 to notify a user of the changed signal. Moreover, as for the MMI functional means 106-114, a user can also input the contents of a message.

[0017] With reference to drawing 1, the outline of the first example of this invention of operation is explained. A signal converter 100 receives the sound signal 101 from a message partner by CPU102. CPU102 stores the received sound signal 101 in RAM104. Furthermore, CPU102 compares and changes the signal which the sight-and-hearing-handicaps person in the sound signal 101 in RAM104 and ROM105 can recognize.

[0018] It is transmitted to the MMI section 113, and the changed signal controls LCD106 and LED107 grade, and notifies a user of the sound signal 101 from the exchange.

[0019] Moreover, a signal converter 100 has the key 112 grade into which a user can input the contents of a message. It is transmitted to CPU102 through the MMI section 113, and the signal inputted from the key 112 grade is stored in RAM104.

[0020] Furthermore, CPU102 compares and changes the signal in RAM104, and the sound signal 101 in ROM105. The changed sound signal 101 is transmitted to a message partner.

[0021] Next, actuation of the first example of this invention is explained.

[0022] In the case of a receiver, the contents of a message are transmitted to the body of telephone as a sound signal 101 through the exchange. A signal converter is equipped with a non-illustrated A/D converter, and changes the analog sound signal 101 into a digital sound signal. A digital sound signal is inputted into CPU102, and is once accumulated into RAM104.

[0023] Here, into ROM105, the signal transformation table which the digital sound signal-Morse code or a user can recognize is accumulated.

[0024] CPU102 compares the signal transformation table in ROM105 with the digital sound signal in RAM104, and changes it into the signal with which the Morse code or a user can recognize the sound signal 101 from a message partner.

[0025] Furthermore, based on the signal which the Morse code or a user can recognize, CPU102 controls the MMI section 113, blinks LED107, and transmits the contents of a message from a message place to a user.

[0026] Moreover, in transmission, the contents of transmission from a user are inputted into the MMI section 113 by a user's pushing key 112 and inputting the signal which the Morse code or a user can recognize.

[0027] The MMI section 113 transmits the signal which the Morse code or the user whom the user inputted can recognize to CPU102. CPU102 performs actuation contrary to the time of a receiver, and transmits the contents of a message to the exchange.

[0028] That is, CPU102 once accumulates the signal which the Morse code or the user whom the user inputted can recognize into RAM104. Here, since the signal transformation table which the digital sound signal-Morse code or a user can recognize is accumulated into ROM as mentioned above, CPU102 compares the signal transformation table in ROM105 with that in RAM104, and changes into a digital sound signal the signal which the Morse code or the user whom the user inputted can recognize.

[0029] Furthermore, a digital sound signal is changed into the analog sound signal 101 by the non-illustrated D/A converter, and is transmitted to the exchange.

[0030] In addition, since the sound signal 101 encoded from the exchange is transmitted in the case of a digital portable telephone, a message becomes possible by changing the conversion table in ROM105 to the signal which the voice message identification code-Morse code or a user can recognize, without performing A/D conversion and D/A conversion.

[0031] Next, other examples of this invention are explained below.

[0032] The second example of this invention is explained. Since a sight-and-hearing-handicaps person cannot recognize the flashing display by LED107, he changes LED107 in said first example to vibrator in the second example of this invention. By vibrator, the signal which the Morse code or a user can recognize is told to a user by vibration.

[0033] The third example of this invention is explained. An alphabetic signal is used for the third example of this invention instead of being the signal which the Morse code or a user can recognize using LCD106, a key 112, and touch panel 114 grade.

[0034] In the case of a receiver, the contents of a message are transmitted to the body of telephone as a sound signal 101 through the exchange. A signal converter 103 is equipped with a non-illustrated A/D converter, and changes the analog sound signal 101 into a digital sound signal. A digital sound signal is inputted into CPU102, and is once accumulated into RAM105.

[0035] Here, into ROM105, the digital sound signal-alphabetic character signal transformation table is accumulated. CPU102 compares the digital sound signal in the signal transformation table in ROM105, and RAM104, and changes the sound signal 101 from a message partner into an alphabetic signal.

[0036] Furthermore, CPU102 controls the MMI section 113 based on an alphabetic signal, it is made it to carry out character representation to LCD106, and it transmits the contents of a message from a message place to a user.

[0037] Moreover, in transmission, a user pushes key 112, and when [which input an alphabetic signal] it depends especially or a user does the handwriting input of the contents of transmission at a touch panel 114, the contents of transmission from a user are inputted into the MMI section 113.

[0038] The MMI section 113 transmits the alphabetic signal which the user inputted to CPU102. CPU102 performs actuation contrary to the time of a receiver, and transmits the contents of a message to the exchange. That is, CPU102 once accumulates the alphabetic signal which the user inputted into RAM105.

[0039] Here, since the digital sound signal-alphabetic character signal transformation table is accumulated into ROM105 as mentioned above, CPU102 compares the conversion table in ROM105 with that in RAM104, and changes into a digital sound signal the alphabetic signal which the user inputted.

[0040] Furthermore, said digital sound signal is changed into the analog sound signal 101 by the non-illustrated D/A converter, and is transmitted to the non-illustrated exchange.

[0041] In addition, since the sound signal 101 encoded from the exchange is transmitted, the message of the case of a digital cellular phone is attained by changing the conversion table in ROM105 to a voice message identification code-alphabetic signal, without performing A/D conversion and D/A conversion.

[0042] The fourth example of this invention uses the Braille-points monitor 109, the Braille-points printer 110, and the Braille-points reader 111 for an interface with a user, and makes a user interface a Braille-points signal. A detail is explained below.

[0043] First, the Braille-points monitor 109 and the Braille-points reader 111 are explained using drawing 2. Drawing 2 is the perspective view showing the appearance of the portable telephone 201 in the fourth example of this invention. The Braille-points monitor 109 is equipped with the Braille-points display 202, the return carbon button 203, a stepper button 204, the termination carbon button 205, and the Braille-points input section 206, and is constituted.

[0044] Although it is a flat surface at the time, in case the Braille-points display 202 indicates by Braille points, when the corresponding point makes ****, respectively, it usually performs a Braille-points display.

[0045] Here, how to make **** is explained using drawing 3. As shown in drawing 3, the cylinder 302 is arranged in the interior and the Braille-points section of the Braille-points display 202 makes a flat surface/**** by rise and fall of this cylinder.

[0046] Moreover, the following Braille points are displayed by stepper-button 204 depression, and it is fast forwarded by stepper-button 204 length push. It returns similarly, the Braille points in front of one are displayed by carbon button 203 depression, and return carbon button 203 length push rewinds.

[0047] When terminating a display and returning the Braille-points display 202 to a flat surface, termination carbon button 205 depression is carried out.

[0048] Moreover, the Braille-points input section 206 consists of six carbon buttons which mean each point of Braille points. For example, these six carbon buttons serve as the dial carbon button of the body of telephone, and as shown in drawing 2, they arrange it. The depression of each point means **** of Braille points, and it is transmitted by carrying out the depression of the stepper button 204. The Braille points under input perform cancellation by return carbon button 203 depression.

[0049] In addition, the Braille points under input are displayed on the Braille-points display 202, and termination carbon button 205 depression performs the display change of a transmitting Braille-points display and a receiving Braille-points display. In addition, the display change is unnecessary, when the Braille-points display 202 is divided into the object for transmission, and reception and is prepared two.

[0050] When it is arranged at an equipment pars basilaris ossis occipitalis and a user traces a Braille-points top directly, the Braille-points reader 111 **** **** of Braille points by the tripartite measure by the infrared sensor, or the tactile feeling sensor, and recognizes Braille points.

[0051] Next, the detail of the fourth example of this invention is explained. In the case of a receiver, the contents of a message are transmitted to the body of telephone as a sound signal 101 through the exchange.

[0052] A signal converter 103 is equipped with a non-illustrated A/D converter, and changes the analog sound signal 101 into a digital sound signal. A digital sound signal is inputted into CPU102, and is once accumulated into RAM105. Here, into ROM, the digital sound signal-Braille-points signal transformation table is accumulated.

[0053] CPU102 compares the digital sound signal in the conversion table in ROM105, and RAM104, and changes the sound signal 101 from a message partner into a Braille-points signal. Furthermore, CPU102 controls a Braille-points printer through the

MMI section 113 based on said Braille-points signal.

[0054] The Braille-points printer 110 transmits the contents of a message from a message place to a user by making **** with a press and printing out the roll-like space which carried out the Braille-points notation. Or the contents of a message are transmitted to a user using the Braille-points monitor 109 shown in drawing 2.

[0055] Moreover, in transmission, when a user inputs a Braille-points signal using the Braille-points reader 111 or the Braille-points monitor 109, the contents of transmission from a user are inputted into the MMI section 113.

[0056] The MMI section 113 transmits the Braille-points signal which the user inputted to CPU102. CPU102 performs actuation contrary to the time of a receiver, and transmits the contents of a message to the exchange. That is, CPU102 once accumulates the Braille-points signal which the user inputted into RAM105.

[0057] Here, as mentioned above, since the digital sound signal-Braille-points signal transformation table is accumulated into ROM, CPU102 compares the conversion table in ROM105 with that in RAM104, and changes into a digital sound signal the Braille-points signal which the user inputted. Furthermore, said digital sound signal is changed into the analog sound signal 101 by the D/A converter, and is transmitted to the exchange.

[0058] In addition, since the sound signal 101 encoded from the exchange is transmitted in the case of a digital cellular phone, a message becomes possible by changing the conversion table in ROM105 to a voice message identification code-Braille-points signal, without performing A/D conversion and D/A conversion.

[0059]

[Effect of the Invention] As explained above, according to this invention, the effectiveness that a hearing-impaired person and a sight-and-hearing-handicaps person as well as a healthy person can talk over the telephone using a domestic telephone, a personal digital assistant, etc. is done so by having had a means to change a sound signal into the signal which a hearing-impaired person and a sight-and-hearing-handicaps person can recognize.

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CLAIMS

[Claim(s)]

[Claim 1] The signal converter characterized by having a means to change a sound signal into the Morse code and to output this Morse code signal through a display means or an oscillating means, and a means to change into a sound signal the Morse code signal inputted from the input means, and to transmit.

[Claim 2] The signal converter according to claim 3 characterized by having the signal transformation table which stored correspondence with a digitized voice signal and the Morse code by the tabular format, and performing conversion with a sound signal and the Morse code with reference to said signal transformation table.

[Claim 3] The signal converter characterized by having a means to change into a sound signal a means to change a sound signal into an alphabetic signal and to output this alphabetic signal to a display means, and the input signal from a keyboard or the signal which changed into the character code the alphabetic character by which the handwriting input was carried out from the touch panel.

[Claim 4] The signal converter according to claim 1 characterized by having the signal transformation table which stored correspondence with a digitized voice signal and a character code by the tabular format, and performing conversion of a sound signal and an alphabetic signal with reference to said signal transformation table.

[Claim 5] The signal converter characterized by having the means which changes a sound signal into a Braille-points signal, and carries out a Braille-points output, and a means to change into a sound signal the Braille-points signal inputted from the Braille-points input means, and to transmit.

[Claim 6] The signal converter according to claim 4 characterized by having the signal transformation table which stored correspondence with a digitized voice signal and a Braille-points code by the tabular format, and performing conversion of a sound signal and a Braille-points signal with reference to said signal transformation table.

[Claim 7] A means to change a sound signal into the Morse code and to output this Morse code signal through a display means or an oscillating means, A means to change into a sound signal the Morse code signal inputted from the input means, and to transmit, A means to change into a sound signal a means to change a sound signal into an alphabetic signal and to output to a display means, and the input signal from a keyboard or the signal which changed into the character code the alphabetic character by which the handwriting input was carried out from the touch panel, The means which changes a sound signal into a Braille-points signal, and carries out a Braille-points output, and a means to change into a sound signal the Braille-points signal inputted from the Braille-points input means, and to transmit, The 1st signal transformation table which stored correspondence with a digitized voice signal and the Morse code by the tabular format, A digitized voice signal and the 2nd signal transformation table which stored correspondence of a character code by the tabular format, The signal converter characterized by what it has the 3rd signal transformation table which stored correspondence with a digitized voice signal and a Braille-points code by the tabular format, and signal transformation between a sound signal, and the Morse code, an alphabetic signal and a Braille-points signal is performed for with reference to said each signal transformation table.

[Claim 8] A Braille-points input means to have a carbon button beside [two] three length, and to perform a Braille-points input by making the pushed carbon button into ****, While equipping the corresponding point beside [two] three length with a Braille-points display means to perform a Braille-points display by forming ****, being inputted from said Braille-points input means, carrying out signal transformation of the Braille-points sign and changing and transmitting to a sound signal The signal converter characterized by having a means to change the received sound signal into a Braille-points sign, and to output to said Braille-points display means.

[Claim 9] The signal converter according to claim 8 characterized by what said Braille-points display means arranges a rod-like column into the hole which has opening on a display front face corresponding to each point, enabling a free round trip, and the end face of this column is made into the same field as said display front face, and usually moves in the direction in which said end face of the column of the point which corresponds at the time of **** formation of ** of a Braille-points display forms a hollow from said display flat surface at the time of the flat-surface formation at the time.

[Claim 10] The signal converter according to claim 8 or 9 characterized by having a means to perform delivery control of the Braille points displayed in said Braille-points display, and return control.

[Claim 11] The signal converter according to claim 8 or 9 further equipped with the means which carries out Braille-points printing of the Braille-points signal which changed said received sound signal, and the Braille-points reading means.

[Claim 12] Telephone equipped with the signal converter according to claim 1 to 11.

[Claim 13] Personal digital assistant equipment equipped with the signal converter according to claim 1 to 11.

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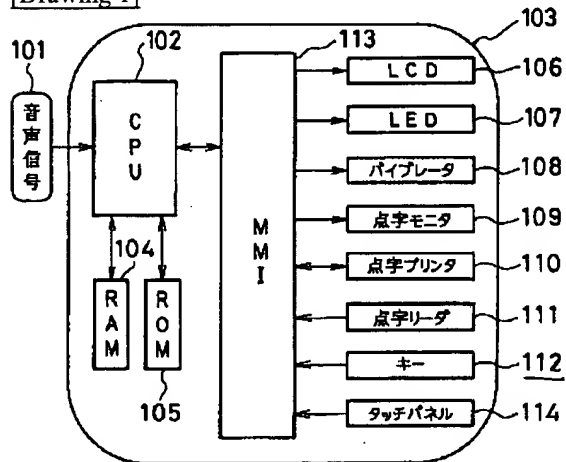
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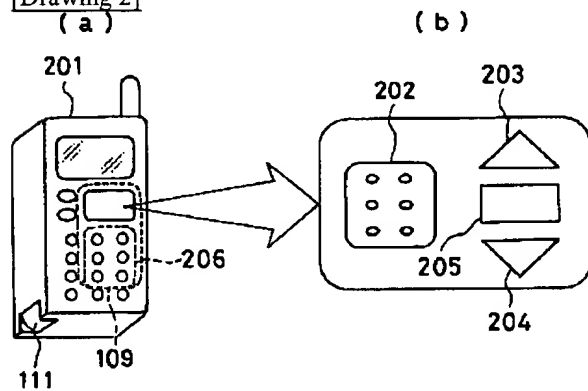
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DRAWINGS

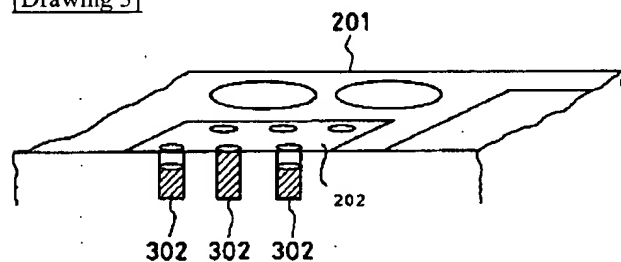
[Drawing 1]



[Drawing 2]



[Drawing 3]



[Translation done.]